

We claim:

1. An ethylene polymer composite having improved melt strength comprising:
  - (a) 76 to 99.25 weight percent, based on the weight of the total composition, of an ethylene polymer base resin;
  - (b) 0.5 to 12 weight percent of an organically modified clay consisting of a smectite clay that has been ion-exchanged and intercalated with a quaternary ammonium ion of the formula:

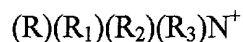


where R represents a C<sub>18</sub> alkyl substituent or mixture of alkyl substituents wherein C<sub>18</sub> alkyl moieties constitute 50% or more of the mixture and R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> are independently selected from the group consisting of R, H and C<sub>1-22</sub> hydrocarbyl; and

- (c) 0.25 to 12 weight percent of an ethylene polymer compatibilizing agent selected from the group consisting of ethylene-vinyl carboxylate copolymers and polymers of ethylene having from 0.1 to 8 weight percent ethylenically unsaturated carboxylic acid or derivative monomer copolymerized or grafted; the weight ratio of (b) to (c) ranging from 1:5 to 1:0.1.
2. The composite of Claim 1 wherein the ethylene polymer base resin is an ethylene homopolymer or a copolymer of ethylene and a comonomer selected from the group consisting of C<sub>3-8</sub> α-olefins, vinyl C<sub>2-4</sub> carboxylates and C<sub>1-4</sub> alkyl acrylates and methacrylates.
3. The composite of Claim 1 wherein the smectite clay is montmorillonite and R is comprised of at least 60% C<sub>18</sub> alkyl groups.
4. The composite of Claim 3 wherein the organically modified clay is a montmorillonite clay modified with a dimethyl dihydrogenated tallow ammonium ion and the modifier concentration is 90 to 130 meq/100g.

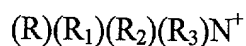
5. The composite of Claim 1 wherein the compatibilizing agent is a copolymer of ethylene and 3 to 35 weight percent vinyl acetate and has a melt index from about 0.25 to 40 g/10 min.
6. The composite of Claim 1 wherein the compatibilizing agent is an ethylene polymer grafted with 0.2 to 4 weight percent maleic anhydride having a melt index from about 0.25 to 40 g/10 min.
7. The composite of Claim 1 wherein the weight ratio of organically modified clay to compatibilizing agent is from 1:1 to 1:0.25.
8. The composite of Claim 2 having a melt index of 0.01 to 100 g/10 min and complex viscosity ratio at 0.1 radians/sec greater than 1.10 and comprising 84 to 98.75 weight percent base resin, 0.25 to 8 weight percent montmorillonite clay modified with dimethyl dihydrogenated tallow ammonium chloride and having a modifier concentration of 90 to 130 meq/100 g, and 0.25 to 8 weight percent of a copolymer of ethylene and 3 to 35 weight percent vinyl acetate having a melt index from 0.25 to 40 g/10 min; the weight ratio of modified montmorillonite clay to ethylene-vinyl acetate copolymer being from 1:1 to 1:0.25.
9. The composite of Claim 2 having a melt index of 0.01 to 100 g/10 min and complex viscosity ratio at 0.1 radians/sec greater than 1.10 and comprising 84 to 98.75 weight percent base resin, 0.25 to 8 weight percent montmorillonite clay modified with dimethyl dihydrogenated tallow ammonium chloride and having a modifier concentration of 90 to 130 meq/100 g and 0.25 to 8 weight percent of an ethylene polymer grafted with 0.2 to 4 weight percent maleic anhydride having a melt index from 0.25 to 40 g/10 min; the weight ratio of modified montmorillonite clay to grafted ethylene polymer being from 1:1 to 1:0.25.
10. An ethylene copolymer composite having improved melt strength comprising:
  - (a) 88 to 99.5 weight percent, based on the weight of the total composite, of an ethylene-vinyl C<sub>2-4</sub> carboxylate copolymer base resin and

- (b) 0.5 to 12 weight percent of an organically modified clay consisting of an organically modified clay consisting of a smectite clay that has been ion-exchanged and intercalated with a quaternary ammonium ion of the formula



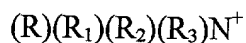
where R represents a represents a C<sub>18</sub> alkyl substituent or mixture of alkyl substituents wherein C<sub>18</sub> alkyl moieties constitute 50 percent or more of the mixture and R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> are independently selected from the group consisting of R, H or a C<sub>1-22</sub> hydrocarbyl.

11. The composite of Claim 10 wherein the base resin is an ethylene-vinyl acetate copolymer having a vinyl acetate content of 2 to 48 weight percent, the organically modified clay is a montmorillonite clay modified with dimethyl dihydrogenated tallow ammonium chloride and the modifier concentration is 90 to 130 meq/100 g.
12. The composite of Claim 11 wherein the ethylene-vinyl acetate copolymer has a vinyl acetate content of 4 to 45 weight percent.
13. The composite of Claim 12 having a melt index of 0.01 to 100 g/10 min and complex viscosity ratio greater than 1.10 and comprised of 92 to 99 weight percent ethylene-vinyl acetate copolymer and 1 to 8 weight percent organically modified clay.
14. A concentrate useful for the preparation of ethylene polymer composites having improved melt strength comprising 20 to 70 weight percent, based on the total weight of the concentrate, of a carrier resin selected from the group consisting of ethylene homopolymer and copolymers of ethylene and a comonomer selected from the group consisting of C<sub>3-8</sub> α-olefins, vinyl C<sub>2-4</sub> carboxylates and C<sub>1-4</sub> alkyl acrylates and C<sub>1-4</sub> alkyl methacrylates and 30 to 80 weight percent additives comprising an organically modified clay consisting of a smectite clay that has been ion-exchanged and intercalated with a quaternary ammonium ion of the formula



where R represents a represents a C<sub>18</sub> alkyl substituent or mixture of alkyl substituents wherein C<sub>18</sub> alkyl moieties constitute 50 percent or more of the mixture and R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> are independently selected from the group consisting of R, H or a C<sub>1-22</sub> hydrocarbyl and an ethylene polymer compatibilizing agent selected from the group consisting of ethylene-vinyl carboxylate copolymers and polymers of ethylene having 0.1 to 8 weight percent ethylenically unsaturated carboxylic acid or derivative monomer copolymerized or grafted, the weight ratio of organically modified clay to compatibilizing agent ranging from 1:5 to 1:0.1.

15. The concentrate of Claim 14 wherein the organically modified clay is a montmorillonite clay modified with dimethyl dihydrogenated tallow ammonium chloride and the modifier concentration is 90 to 130 meq/100 g and the compatibilizing agent is a copolymer of ethylene and 3 to 35 weight percent vinyl acetate or an ethylene polymer grafted with 0.2 to 4 weight percent maleic anhydride.
16. The concentrate of Claim 15 containing 20 to 60 weight percent carrier resin, 40 to 80 percent of a combination of organically modified clay and compatibilizing agent present at a weight ratio of 1:1 to 1:0.25 and, optionally, up to 5 weight percent conventional compounding additives.
17. A concentrate useful for the preparation of ethylene-vinyl acetate composites having improved melt strength comprising 20 to 70 weight percent of an ethylene-vinyl acetate copolymer carrier resin and 30 to 80 weight percent organically modified clay consisting of a smectite clay that has been ion-exchanged and intercalated with a quaternary ammonium ion of the formula



where R represents a represents a C<sub>18</sub> alkyl substituent or mixture of alkyl substituents wherein C<sub>18</sub> alkyl moieties constitute 50 percent or more of the mixture and R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> are independently selected from the group consisting of R, H or a C<sub>1-22</sub> hydrocarbyl.

18. The concentrate of Claim 17 wherein the carrier resin is a copolymer of ethylene and 3 to 35 weight percent vinyl acetate and the organically modified clay is a montmorillonite clay modified with dimethyl dihydrogenated tallow ammonium chloride and the modifier concentration is 90 to 130 meq/100g.
19. The concentrate of Claim 18 containing 20 to 60 weight percent carrier resin and 40 to 80 weight percent organically modified clay.
20. The concentrate of Claim 19 optionally containing up to 5 weight percent conventional compounding additives.